

Dept of Education

mac T

P.91

3/ Education and Industrial Efficiency

REPORT

OF

ALBERT H. LEAKE,

Inspector of Technical Education,

To the Minister of Education

ON

RECENT DEVELOPMENTS IN THE SCHOOLS OF THE EASTERN
STATES.

ISSUED AS AN APPENDIX TO THE REPORT OF THE MINISTER OF
EDUCATION FOR THE YEAR 1905

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO

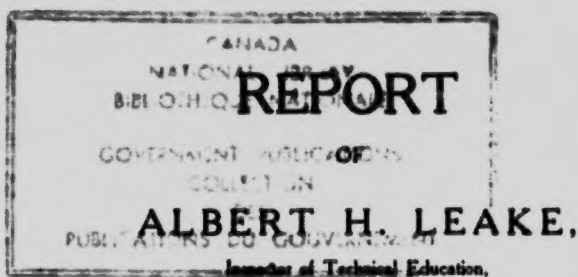


TORONTO:

Printed and Published by L. K. CAMERON, Printer to the King's Most Excellent Majesty
1906

95 DFOE

Education and Industrial Efficiency



To the Minister of Education

ON

RECENT DEVELOPMENTS IN THE SCHOOLS OF THE EASTERN
STATES.

ISSUED AS AN APPENDIX TO THE REPORT OF THE MINISTER OF
EDUCATION FOR THE YEAR 1905'

PRINTED BY ORDER OF
THE LEGISLATIVE ASSEMBLY OF ONTARIO



TORONTO:
Printed and Published by L. K. CAMERON, Printer to the King's Most Excellent Majesty
1906



WARWICK BROS & RUTTER, Limited, Printers
TORONTO

09500310

LIST OF SCHOOLS VISITED.

1. Technical High School, Springfield.
2. Mechanic Arts High School, Boston.
3. Rindge Manual Training High School, Cambridge.
4. Manual Training High School, Brooklyn.
5. Stuyvesant High School, New York.
6. Girls' Technical High School, New York.
7. Manhattan Trade School for Girls, New York.
8. Pratt Institute, Brooklyn.
9. New York Trade School, New York.
10. North-East Manual Training High School, Philadelphia.
11. Central Manual Training High School, Philadelphia.
12. Commercial High School for Girls, Philadelphia.
13. ing Garden Institute, Philadelphia.
14. James Forten Elementary Manual Training School, Philadelphia.
15. Textile School and School of Industrial Art, Philadelphia.
16. Free School of Mechanical Trades, Williamston.

To the Honourable R. A. Pyne, M.D., Minister of Education:

SIR—Owing to the necessity of a reorganization of the Technical High School in the City of Toronto a committee of the Board of Education was appointed to visit certain towns and cities in the Eastern States to make investigation into the question of the most suitable buildings and other matters connected with Technical Education.

On the invitation of this committee, and by your direction, I accompanied the deputation, and, on the completion of their work, pursued the investigation alone for a week longer.

During the two weeks' tour I visited and examined carefully ~~several~~ schools of various types. The main facts gathered are here set forth. Use has also been made of the catalogues issued by these schools. Much information was gathered respecting buildings, equipment, courses of study, methods of teaching and general organization which cannot here be dealt with but which will be brought to the notice of teachers and trustees as necessity arises and occasion offers.

1.—TECHNICAL HIGH SCHOOL, SPRINGFIELD, MASS.

Springfield is a city with a population of 73,450 and a tax rate of 15.2 mills on an assessed valuation of \$81,000,000. One-third of the total amount received



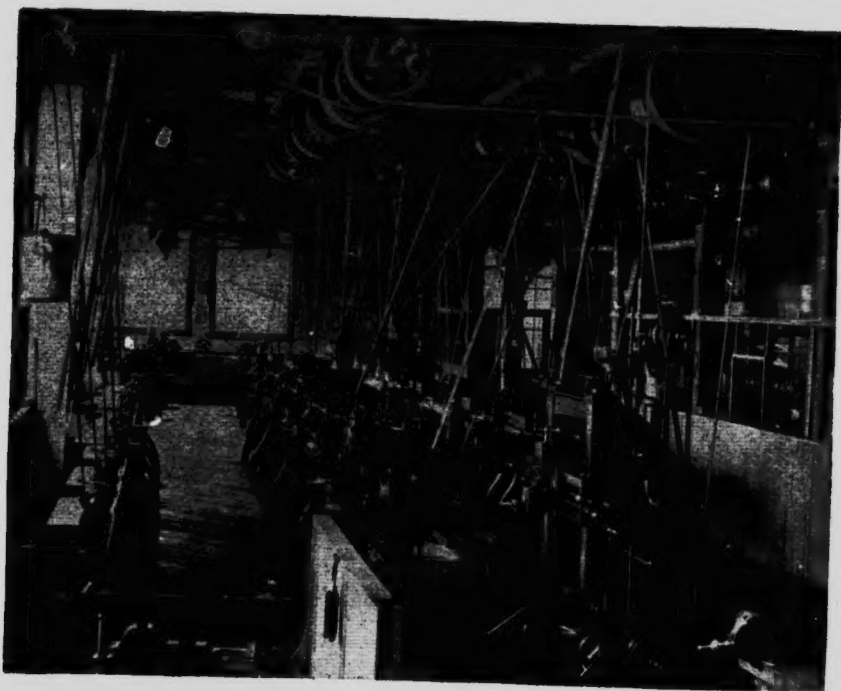
Technical High School, Springfield.

from taxation is spent for educational purposes. A new Technical High School is being erected, part of which is occupied.

When completed this is expected to cost, inclusive of site and equipment, in the neighbourhood of \$350,000, and this in a town not one quarter the size of Toronto. It is at present a school for boys only, though provision is now being

made for girls. The school was organized as a separate institution in 1898 with an enrollment of 18. The attendance is now 225, and the completed building will provide accommodation for from 900 to 1,000. As in most American High Schools the session is a long one—from 8.30 to 2, with half an hour's break for lunch, which is provided in the building by a caterer. Voluntary work is carried on in the shops in the afternoon.

The site covers 30,000 square feet and the building, it is claimed, will be when completed the largest and best equipped high school of this type in New England. It is 239 feet long by 214 deep. There are 22 class rooms in the main building accommodating from 24 to 80 pupils each. There are besides eight rooms on the top floor for physics and chemistry. In this particular the provision seemed to me to be more elaborate than is either advisable or necessary. Four large rooms on this floor are also available for Household Science and other technical work for girls. In the basement there is a gymnasium 76 feet long



Machine Shop Practice and Tool Making, Springfield.

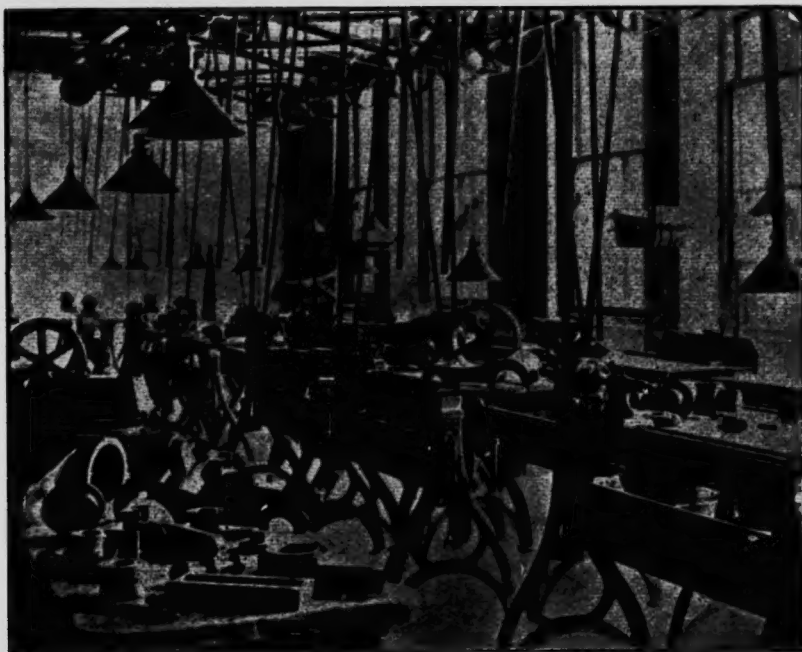
and 57 feet wide, a running track, corridors, lockers, baths, and four other rooms for athletic purposes. The lunch room is also in the basement. Above this on the second floor is the assembly hall. The principals of all the schools visited were very emphatic as to the necessity of such a hall and advanced many arguments in support of their views. The mechanical wing in the rear of the main building is of peculiar design and construction. In the basement of this wing is the forge shop 67 feet square. On one side of the forge shop is the boiler and engine rooms and on the other the foundry and wood turning shops. The basement also contains two rooms for the plumbing classes and the necessary locker rooms. On the first floor of the mechanical wing are three rooms designed for machine shop work and three for joinery and pattern making.

The rear of this wing is carried up two stories higher than the main part. The first of these contains rooms for electrical work, wood finishing and freehand drawing. The top floor of this elevated portion is to be entirely given up to

08 with
uilding
a High
eak for
carried

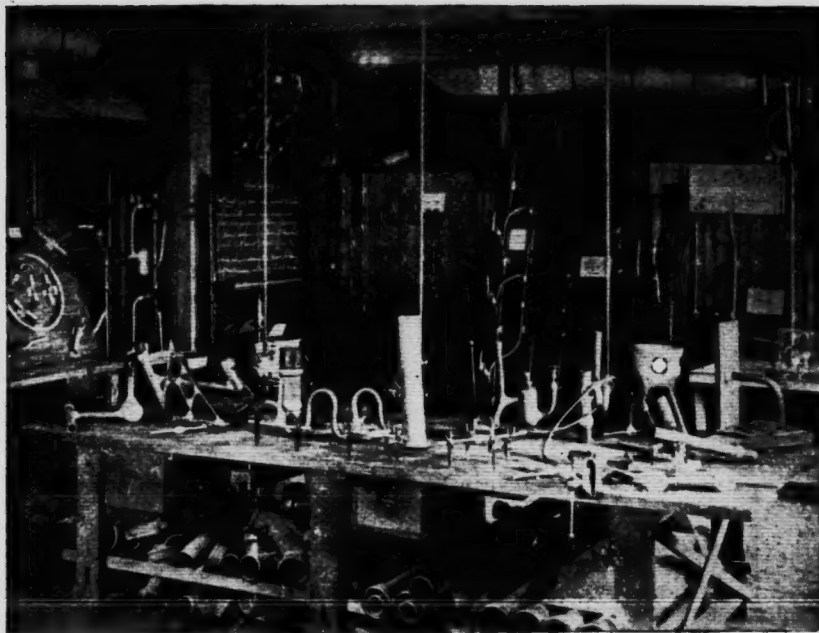
will be
n New
e main
e eight
rovis-
essary.
other
t long

mechanical drawing and is divided into two large drawing rooms, a lecture room and several accessory rooms. The building is of ordinary red brick with Indi-



Wood Turning and Pattern Making, Springfield.

ana limestone trimmings. The central portion around the entrance is built entirely of Indiana limestone. The school offers strong courses in English language

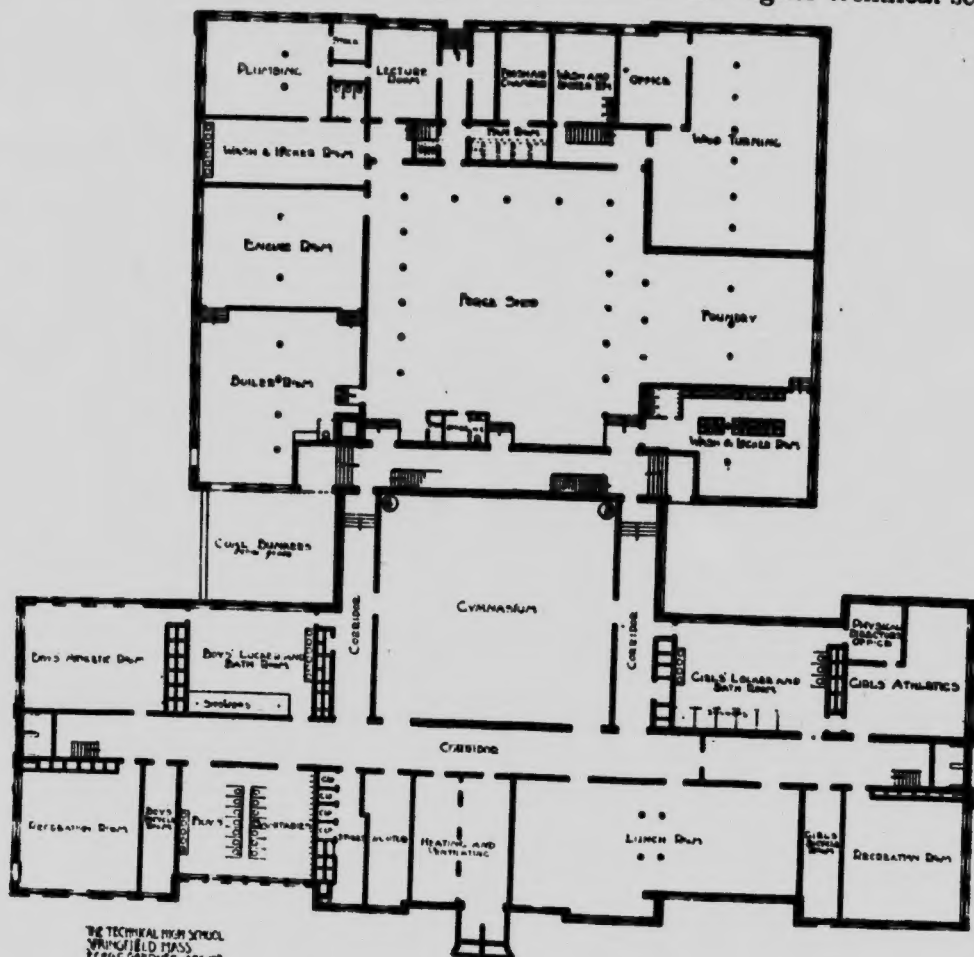


Plumbing Department, Springfield.

and literature, French, freehand and mechanical drawing, history, mathematics and science. The distinctive feature of the school is that it requires of every stu-

dent four years of varied practice in the use of hand and machine tools. The running expenses of the school during 1905 were \$29,257. Three distinct courses are offered :—

1. A preparatory course for schools of technology based upon the requirements for admission to various technical and scientific schools of college grade. Students who take this course are enabled to save from one year to a year and a-half of equivalent work in the higher technical school.



PLAN OF BASEMENT

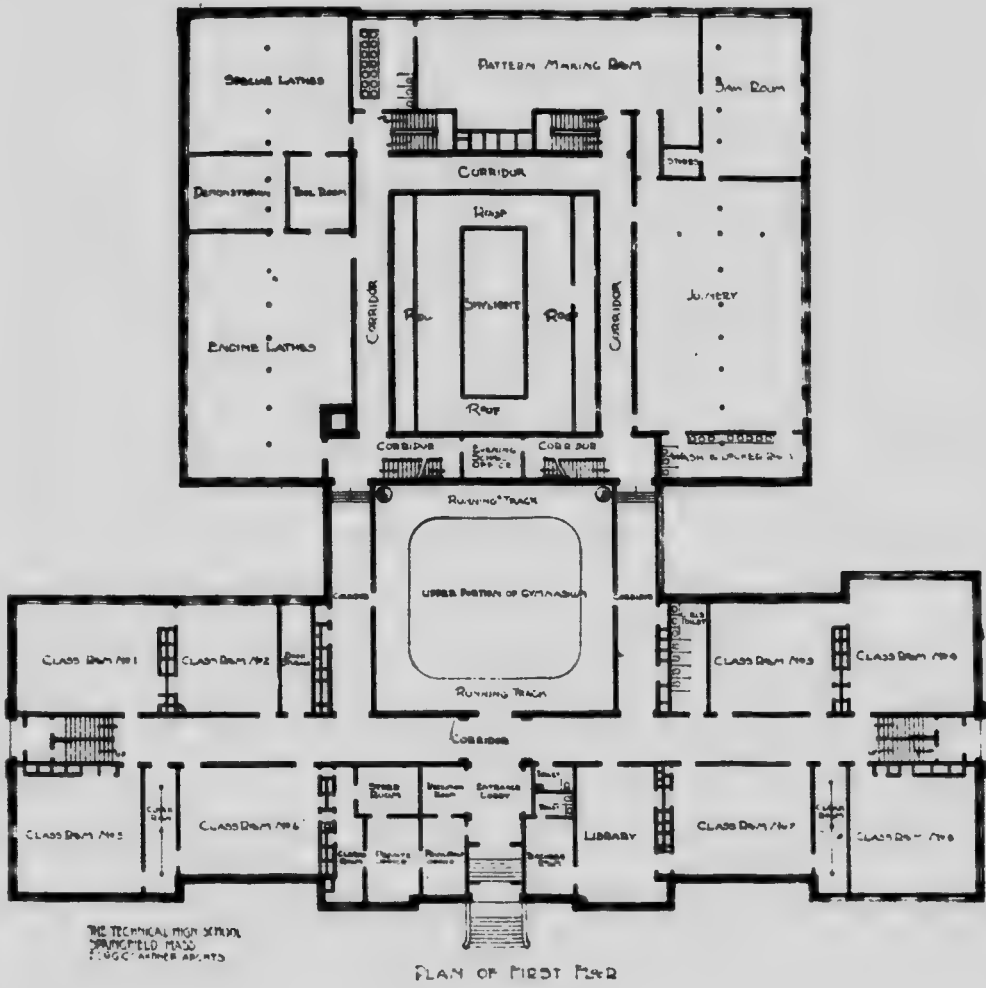
- Such a course as this should, in the case of our own schools, prepare for admission to the School of Practical Science and the School of Mines.
2. A general scientific course, in which it is claimed that the academic work is fully equivalent to that of the general course in the best High Schools; and in addition, a thorough course in drawing and the elements of the mechanic arts is given. The experience of the school shows that boys who have taken this course have readily found employment in desirable positions in which their scientific and manual training proved to be of great service.
 3. A course in which extra shop practice is allowed. This is designed for boys who are not able to do the literary and mathematical work demanded by the other two courses. It offers, however, good work in English, history, physics and mathematics. In the third and fourth

The run-
t courses

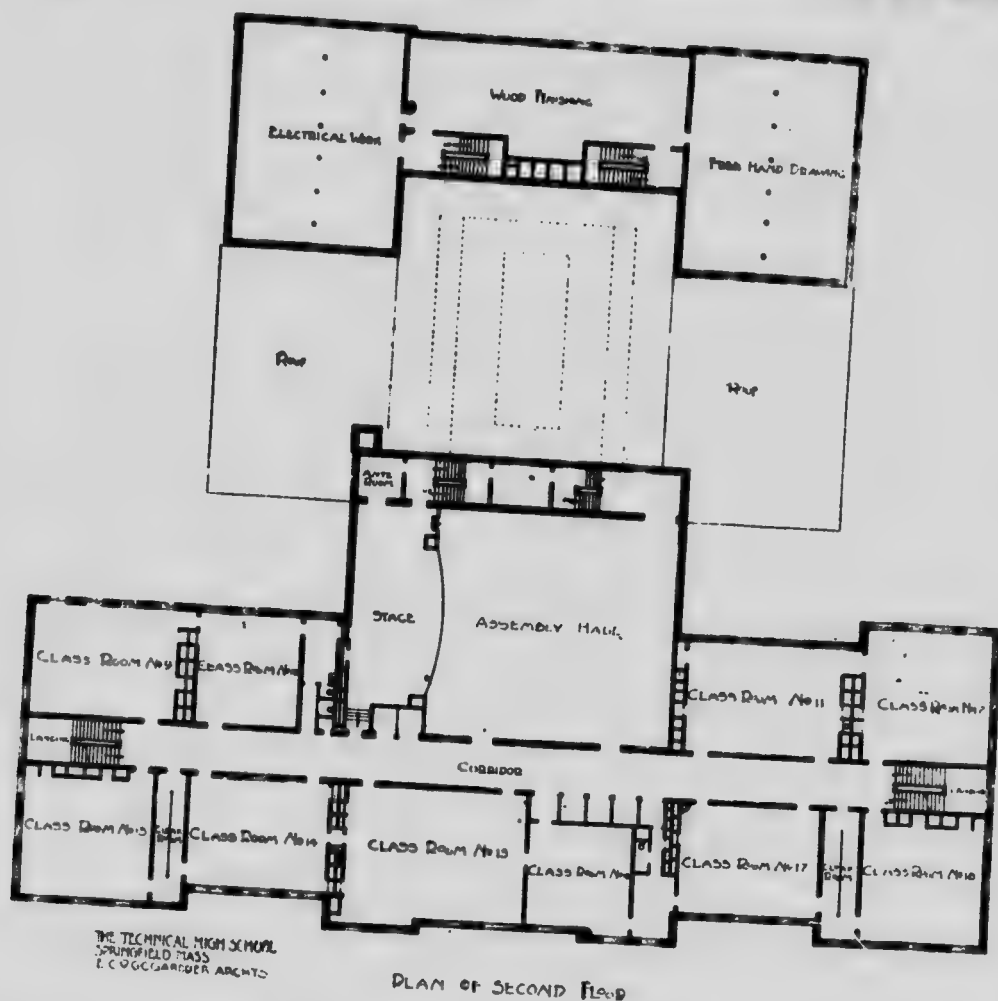
require-
college
one year
school.

years of this course, students are allowed to specialize in the work of
of the drawing-room and the shops.
The subjects taught in the mechanic arts department are as follows :—
First Year :—Drawing, joinery, wood-turning, metal work.
Second Year :—Drawing, pattern-making, molding, vise work, forging.
Third Year :—Drawing, machine shop practice.
Fourth Year :—Machine shop practice, machine drawing, tool making,
cabinet making.
The following table shows, in periods per week, the time spent in academic
and mechanical work in the three courses.

Academic.				Mechanic Arts.		
	1	2	3	1	2	3
1....	17	16	13	13	13	17
2....	15	15	12	15	15	15
3....	20	16	9	10	10	16
4....	20	17	12	10	10	18



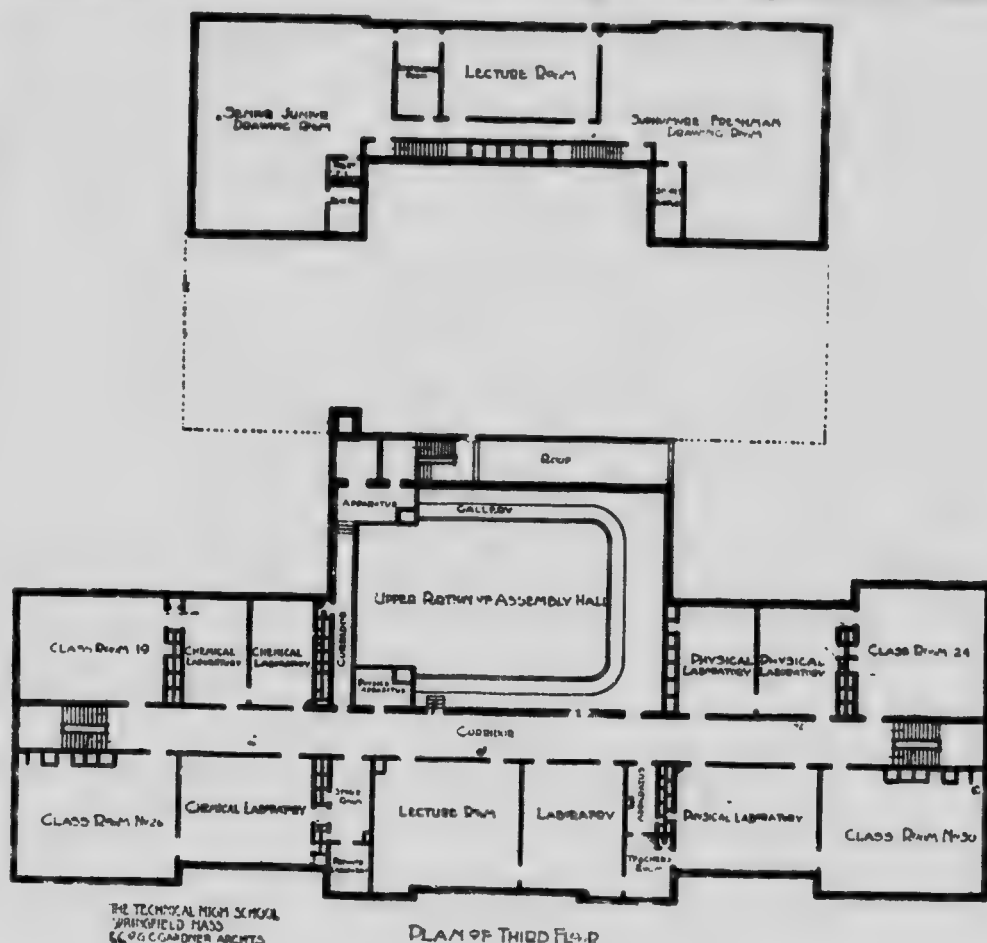
The school is admirably planned and laid out. Boys are admitted from the grammar (public) schools without examination. The equipment of the shops is of the highest character. A feature of the shops here, as in most of the other schools visited, is a demonstration gallery. In front of this gallery are placed appliances such as are used by the student in that particular shop. Before any exercise or piece of work is attempted the teacher gives a demonstration of the processes involved and the tools used. All through the grades of the Public Schools constructive work is taken and manual training is taken in the sixth, seventh, eighth and ninth grades so that the boys who enter the Technical School have some elementary knowledge of mechanical processes and the use of tools.



A unique feature of the school is the Evening Trade School, held in the same building and using the same equipment. This was organized in 1898, and was the first attempt made in the United States to teach trades at the public expense. The first classes were for tool making and plumbing, meeting for three evenings per week, and lasting for a period of five months for three years. Classes are now held in machine shop practice, tool making, wood turning and pattern-making, plumbing, mathematics and electricity. It is the opinion of all in Springfield that this development of the educational system is the most successful and far-reaching effort that has yet been made to make education and

the gram-
s is of the
er schools
ced appli-
any exer-
on of the
he Public
the sixth,
Technical
he use of

life synonymous terms. The attendance is now 500 and is remarkably constant, a percentage of 84.4 being reached. Tuition is free and preference is given to those actually engaged in the trades. The certificates granted by the school have a recognized value in the community. The opinion was expressed that in no part of the school system does a dollar go so far as here. Altogether this school in its building, equipment, organization, and general method of work offers a very good model for the City of Toronto to adopt and adapt for both evening and day school work. Plans of the general arrangement are attached.

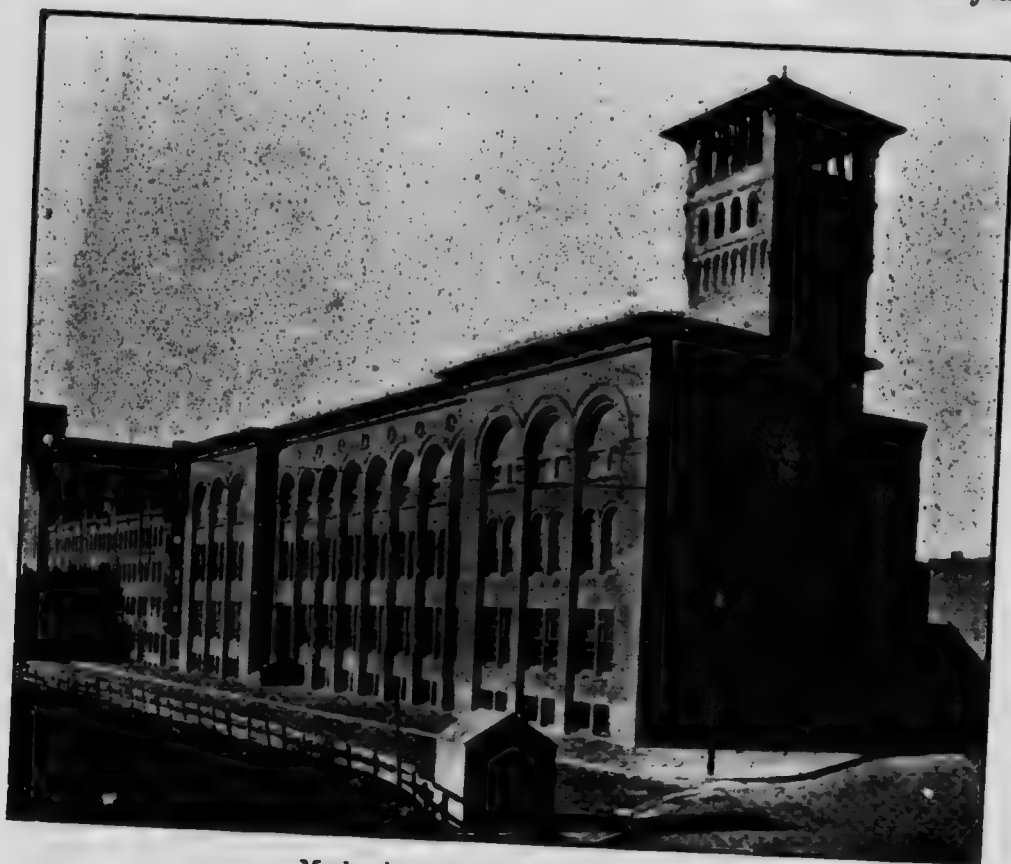


2.—THE MECHANIC ARTS HIGH SCHOOL, BOSTON.

This school was not in session but we were carefully shown over the building and equipment, and gathered much useful information from our inspection.

The usual practice is followed of admitting boys from the Public Schools without examination. The school is so crowded that it is necessary to reject all applications from non-residents. The courses are three and four years in length, and very few electives are offered, owing to the necessity of keeping the entire equipments of the mechanical departments in constant use. The mechanical subjects embrace the following: Drawing, carpentry, joinery, wood carving, wood turning, pattern making, forging of iron and steel, chipping, filing, fitting, and machinist's work with hand and machine tools.

For each department a carefully graduated series of models, the construction of which illustrates every fundamental principle or process, has been chosen. These are made by all the members of a class, while a series of supplemental models are undertaken by those who have completed the class work. Round the walls of the corridors and rooms are displayed the various courses worked in the different shops. In the mechanical departments the students are carefully taught how to judge and criticize their own work. The school is overcrowded, shows constant growth and has a large waiting list, showing that it is providing a kind of education that is in demand. A large addition has been planned which it is hoped by the authorities of the school will soon be commenced. An analysis



Mechanic Arts High School, Boston.

the course of study shows the following comparison of the time spent upon academical and mechanical work in hours per year :

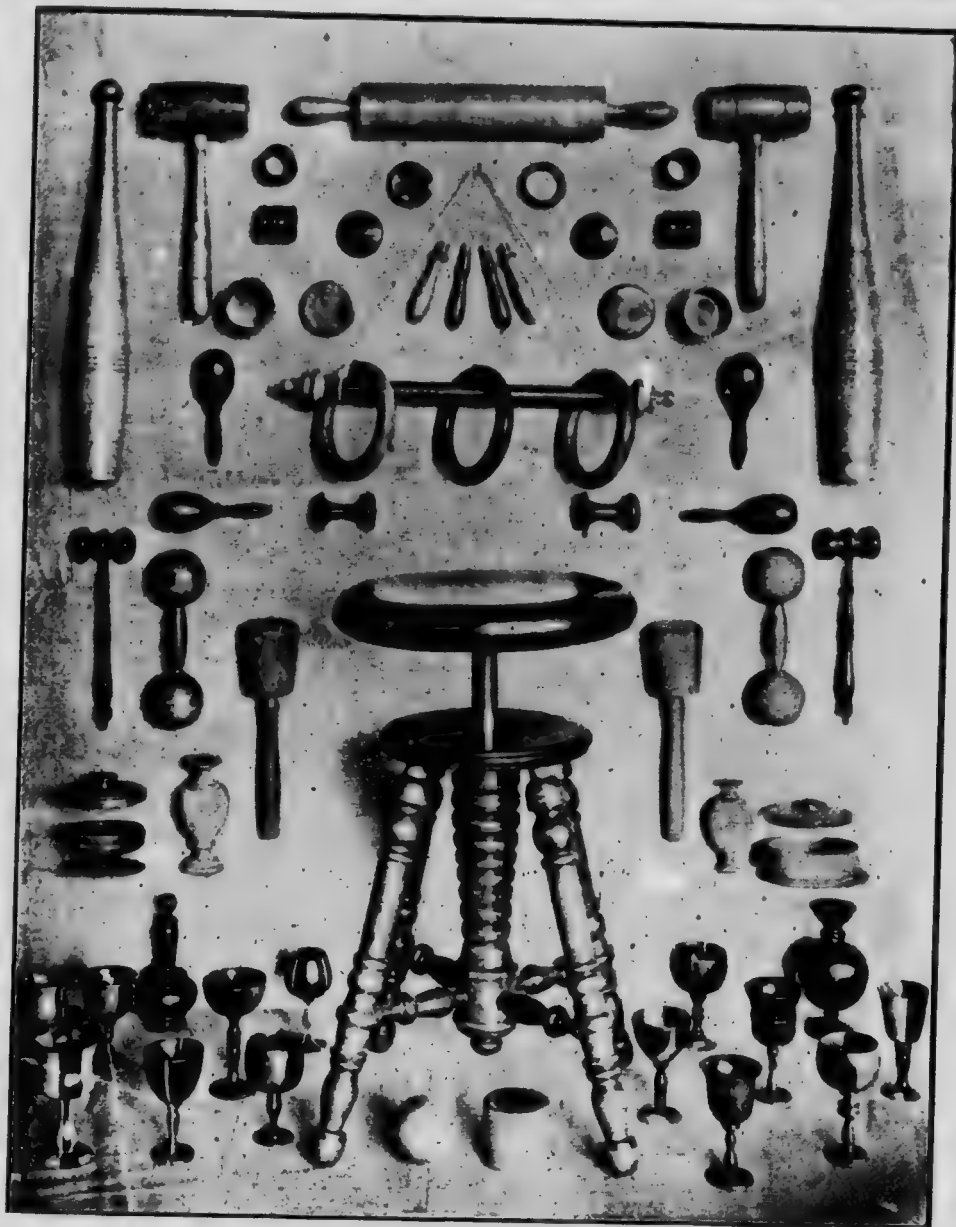
	Academic.	Mechanical.
1.....	400.	600.
2.....	600.	500.
3.....	700.	300.
4.....	600.	500.

An evening trade school was established in this building in September, 1904 the subjects taught being machine drawing, elementary and advanced wood

struction
n chosen.
ementary
ound the
ed in the
lly taught
, shows a
ng a kind
hich it is
analysis of

working, forging and machine shop practice. The cost of the present building, site and equipment was about \$320,000.

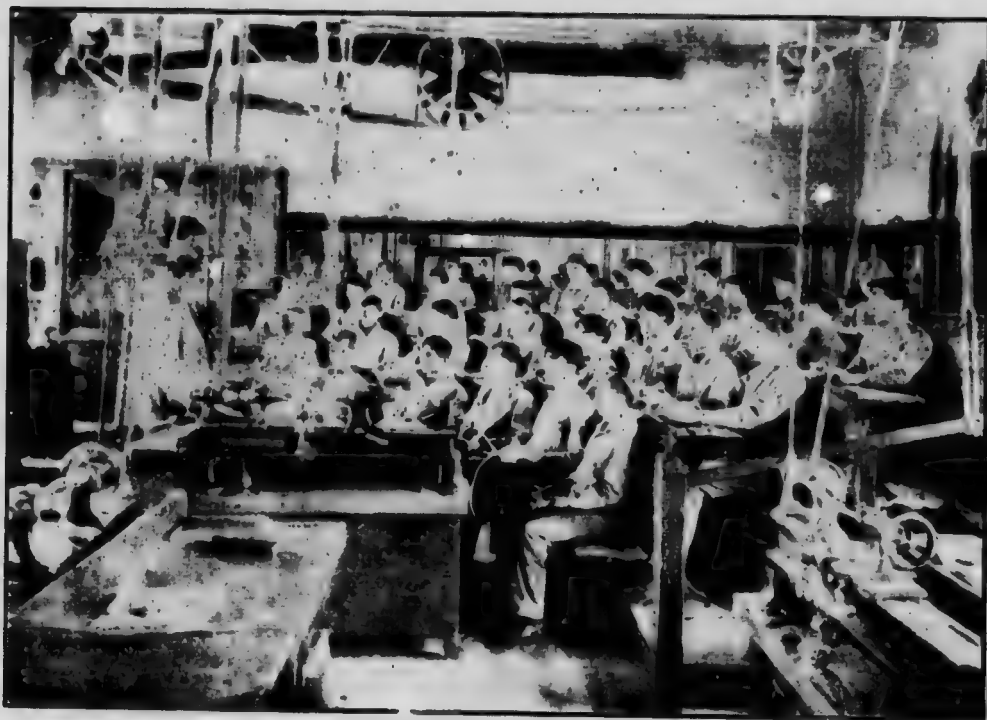
In addition to the Mechanic Arts equipment in this school, an up-to-date wood working equipment is being installed in every academic high school. In



Wood Turning. Mechanic Arts High School, Boston.

In addition to this 90% of the boys in the three upper grades of the grammar (public) schools are also provided with educational woodwork in 43 specially fitted rooms, while those in the lower grades are given work in clay, cardboard, etc., so that handwork forms an integral part of the curriculum from the kindergarten to the end of the High School period. An order of the Board passed July, 1904, provides, "that the course of study for High Schools be amended by

adding the subject of Manual Training to the elective studies; provided, that not more than fifteen points for drawing, household science and arts and manual training combined be allowed to count towards a diploma."



Wood Turning Demonstration Lesson. Mechanic Arts High School, Boston.



Proposed extension of Mechanic Arts High School.

3.—RINDGE MANUAL TRAINING HIGH SCHOOL, CAMBRIDGE, MASS

This School was founded and supported for ten years by the gentleman whose name it bears but is now a municipal school in affiliation with Harvard University. Two buildings are occupied, one for the academic work and the other for the

vided, that
and manual



mechanical departments. The average age of admission is fourteen or fifteen. The building devoted to mechanic arts has two wings. One of these contains the two departments of wood working and the other two departments of iron working. These rooms measure 55 by 60 feet. In the main part of the building are the offices, a tool room, 34 by 70 feet, the boiler room and a room for moulding which was being fitted up. The second story of this main part contains rooms for drawing. In the basement there is a spacious lunch room in which are served hot lunches. About one-third of the time of each student is devoted to the manual arts and the remainder to the subjects usually taught in the High School with the exception of Latin and Greek.

4.—THE MANUAL TRAINING HIGH SCHOOL BROOKLYN.

This school is one of the latest of this particular type as well as one of the largest. The lot is 200 by 300 feet and the building itself,



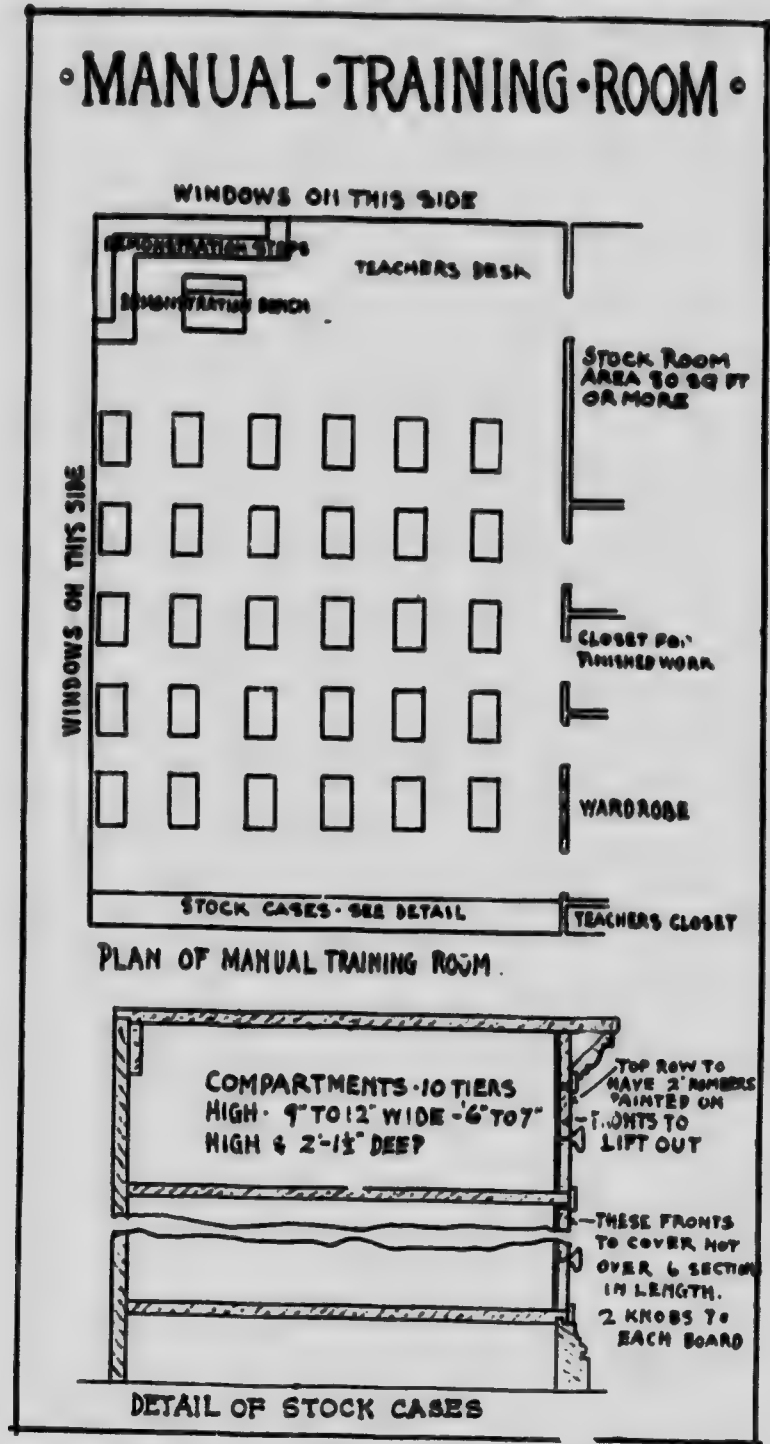
Turning and Pattern Making Shop, Brooklyn.

200 by 215 feet, built in the form of a hollow square, and five stories high including the basement which is entirely above the ground. There are now 2,200 students on the roll, of which number two-thirds are girls. The class unit is 30. There are four freehand drawing rooms, four mechanical drafting rooms, a large auditorium having accommodation for 1530 people, and a gymnasium having a floor space of 84 by 66 feet. The apparatus is so arranged that the whole floor can be easily and quickly cleared. In the basement are three laboratories—a steam engine and dynamo laboratory, an electric testing laboratory and an assay and analytical laboratory. There are four joinery shops each fitted with thirty benches, band saw, turning lathe, grindstone, teacher's bench, demonstration gallery, a tool room, five or six hand basins, and 150 lockers for students. The benches are four feet long and twenty inches wide fitted with a Towles quick action vise, and have a large

, MASS.

an, whose
iversity.
for the

drawer for general tools and six small ones for individual students. The pattern shop is fitted similarly to the joinery shop but each bench is also fitted



Public School Manual Training Room, Boston.

with a Reed lathe. The sheet metal shop has long benches to accommodate thirty students and tools for tinsmithing, repoussé and Venetian iron work.

The pat-
also fitted

The school has also a printing room properly equipped. The blacksmith shop has 16 down draft Buffalo forges and 32 anvils, electric blower and exhaust. This and the machine shops are placed on the top story which is unusual. The machine shop has 30 lathes, drills, grindstones, power hack, saw, universal miller, one plane miller, one gas forge, universal grinder, planer etc. Each lathe,



Rindge Manual Training High School, Cambridge.

moderate
work.

etc., is driven by an individual motor attached to the machine. The household science department consists of four sewing rooms, laundry, two kitchens, pantry, dining rooms, and bedrooms. The rooms are numbered in such a way that the number locates the room. Instantly e. g. room 236 means second floor third corridor and sixth room on that corridor. In connection there is an Evening

2 T. E.

Trade and Technical School which opened with 1600 and closed with 2000 students. The total cost of the building will be somewhere in the neighborhood of \$850,000. Outside the principal's room was noticed a box for the reception of suggestions from the students for the improvement of the school. The salaries paid to the heads of the mechanical departments are \$2,400. The school attracts all classes. The principal stated that some reach the school in \$5000 automobiles and some on foot. A unique feature of the chemical laboratories is that no racks are placed on the tables, all chemicals being provided for in a drawer of peculiar construction. The course is four years in length, academic and mechanical work being divided as follows:—

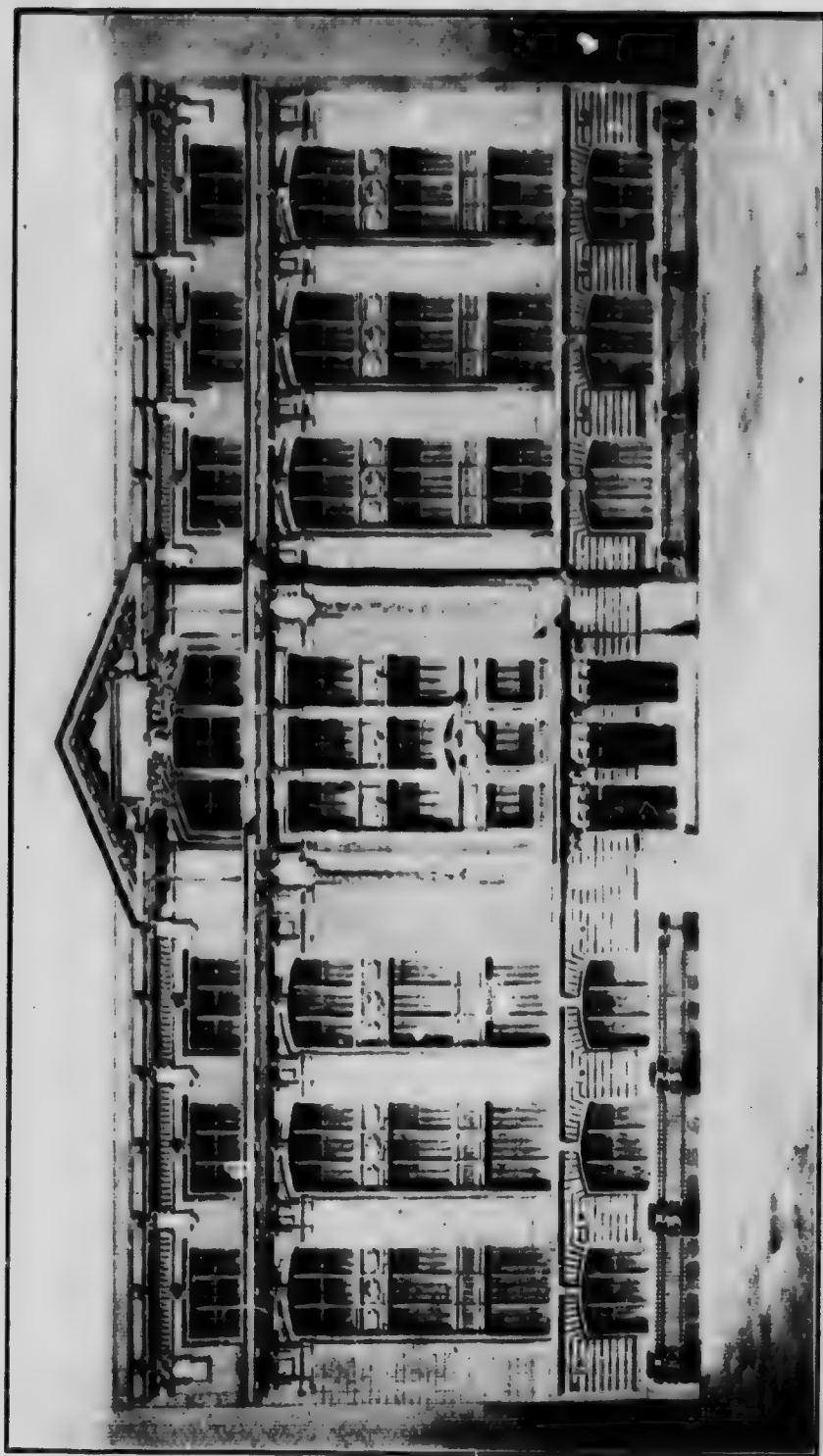
	Academic.	Mechanical.
1.....	15	10
2.....	12	10
3.....	16	8
4.....	11	8

In order to graduate from this school a student must have studied at least one foreign language for at least three years, have accomplished satisfactorily all the other work required, and have taken a sufficient number of elective studies so that the total amount of required and elective studies shall equal 2,500 periods of work requiring preparation and 1,000 periods of drawing and shop work, and shall extend over not less than three years nor more than six years.

5.—THE STUYVESANT HIGH SCHOOL, NEW YORK

This is a Manual Training High School for boys held at present in crowded and unsuitable quarters, but there is on the point of completion a new building which has a frontage of two hundred and ten feet on Fifteenth Street and extends through the whole block, two hundred and six feet, to Sixteenth Street. It will contain fifty-three classrooms, three physical laboratories, three chemical laboratories, three lecture-rooms, a library, an auditorium with a seating capacity of about 1,600, a gymnasium with elevated running track and gallery, a lunch room, bath and locker rooms, eight joinery laboratories, four wood-turning and pattern-making laboratories, one foundry, two forge rooms, one mechanical testing laboratory, and nine draughting rooms. The building is a modification of the letter H type, affording the maximum amount of light and air with the greatest economy of floor space. The site contains almost exactly an acre of ground, and, as the building is to be five stories high with a basement, it will contain an actual floor area of about five acres. The side of the "H" toward Fifteenth Street contains the rooms for the ordinary academic work; the crossbar of the letter is occupied by science laboratories and lecture-rooms, and the northern side of the building is devoted to draughting rooms and shops for carpentry, wood-turning and pattern-making, foundry work, blacksmithing, and machine-shop work.

On the first floor are laboratories for advanced chemistry, the shop for more advanced forge work, the foundry, and two draughting rooms. On the second floor are the machine shop, mechanical laboratory, pattern-making shops, physical laboratories and lecture-room, draughting rooms, classrooms and administrative offices. On the third floor are the library, elementary chemical and physical laboratories and lecture-room, blacksmith shop, construction and milling room, wood-turning shops, and classrooms. The fourth and



Stuyvesant Manual Training High School, N. Y.

fifth floors are occupied by classrooms, draughting rooms, general lecture-room and the carpenter shops for first year work. The basement contains the gymnasium with bath and locker rooms adjacent, the lunch room, and the auditorium. The basement also contains the lighting, heating, ventilating, and power plant.

Special accommodation has been provided for the classes of an evening trade school, for evening lectures, and for evening exhibitions and demonstrations of the regular work of the day school. It is expected that the school will be an educational centre for the city during the hours of the evening.

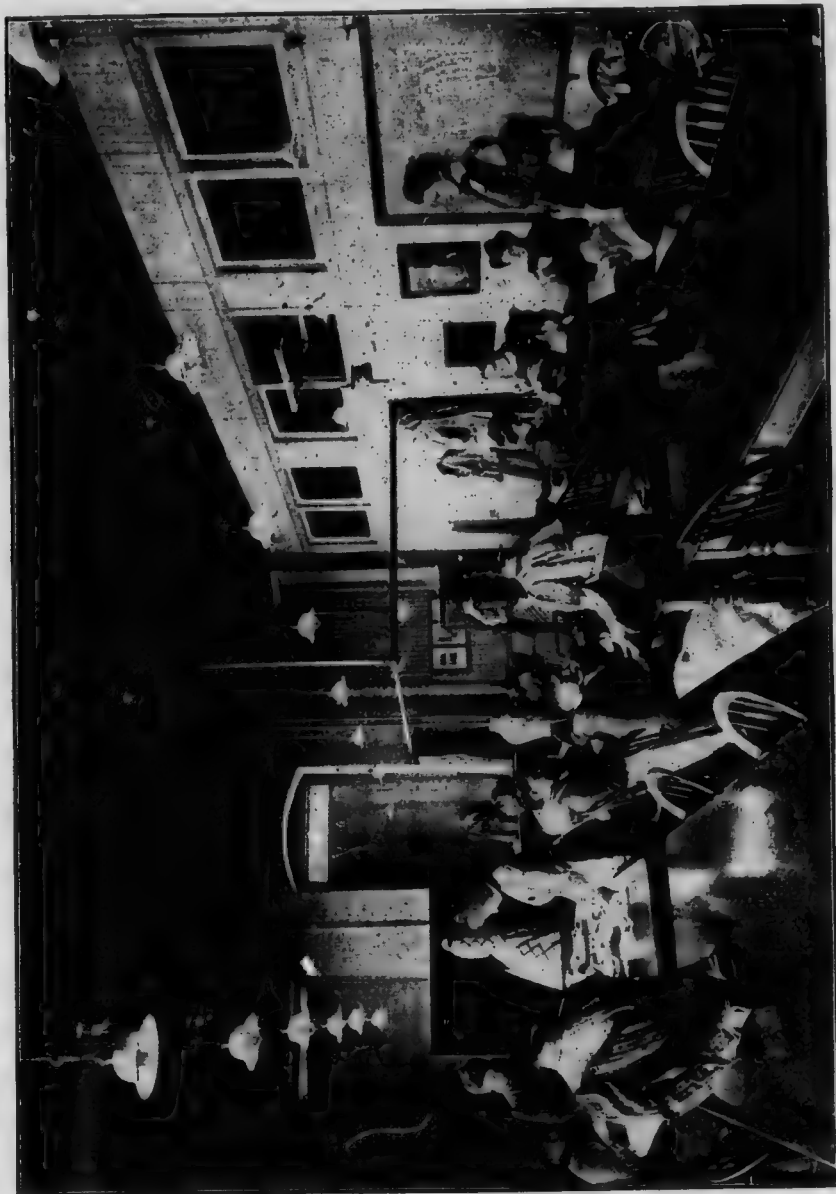
The building is of fireproof construction, thoroughly ventilated, provided with ample stairways, elevators, internal telephones, electric time service, and all the equipment of a modern office building.

The cost will be, when completely equipped, over \$1,200,000. A feature that strikes one on a visit to this school is the skill and ingenuity that the principal has shown in overcoming the difficulties encountered owing to the limitations of the present building. The course of study is the same as the Brooklyn school. This is a boys' school accommodating at present 500. Fifty-two per cent. of the boys are in the first year, twenty-six per cent. in the second year, thirteen per cent. in the third year, and nine per cent. in the fourth year. The arrangement of power is somewhat different from the individual motors in use at the Brooklyn school. Machines that are used only occasionally are run by individual motors, and lines of lathes are run by separate motors, thus reducing expense and not lessening efficiency. In the shops all the boys were wearing overalls and jumpers and were intensely interested and workmanlike. In the mechanical drawing department was noticed a complete apparatus for blue printing by electric light. A visit to this school under the guidance of its expert and far-seeing principal is an education and a revelation of the possibilities, the future and the place of a wisely combined scheme of academic and mechanical work in any system of education.

6.—GIRLS TECHNICAL HIGH SCHOOL, NEW YORK.

This school is held in one central building with three annexes in the immediate neighbourhood. The quarters cannot be considered palatial by any means as they have been described over and over again by newspaper reporters visiting the school as a disgrace to the city, and all visitors will agree that this is putting it mildly. The number of pupils on the register is 2,500. A large number of elective courses are offered. The total number of school periods per week is thirty. Separate courses suitable for stenographers, and typewriters, dressmakers and embroiderers, milliners, designers, printers, bookbinders and library assistants are provided. Each of these courses takes up nineteen periods per week, the remaining eleven being given to ordinary academic subjects including German, French, Latin or Spanish. The principal of the school is Mr. W. McAndrew. The first thing seen on entering is a string of mottoes extending across the hall "Welcome, Willkommen. Bienvenido, Benvenuto, Salve, Xaibe." Every morning before nine o'clock the principal receives three or four girls sent from each class bringing specimens of the best work done during the preceding day. In this way he gets to know other than the troublesome pupils. Beginning with 338 students in 1902 the school has grown to its present membership. A more definite training for the occupations and responsibilities of life is given than in schools of the older type as it prepares girls to earn their living at an early age while contributing largely to their physical and mental culture. That prejudice against this form of education exists even in the democratic States is shown by the fact that the girls attending the traditional form of High School have named this institution "The Academy for Sales Ladies." In all practical work considerable attention is paid to speed, the time taken by each object or exercise being clearly marked upon the finished article. This school was started under difficulties, but the way they were overcome shows the initiative, self-reliance and pluck of the teachers. For instance

the cooking classes had nothing to work with and no money to buy utensils. One of the teachers went to a large department store and the manager lent bowls, spoons and dishes. Empty wooden boxes were sent to serve as seats, chairs being lacking. The gas company lent stoves and for months the girls worked as best they could and did good work, too. The school employs eighty teachers. Full academic courses are offered, but even the girls who elect to take them are choosing in addition the housekeeping course.

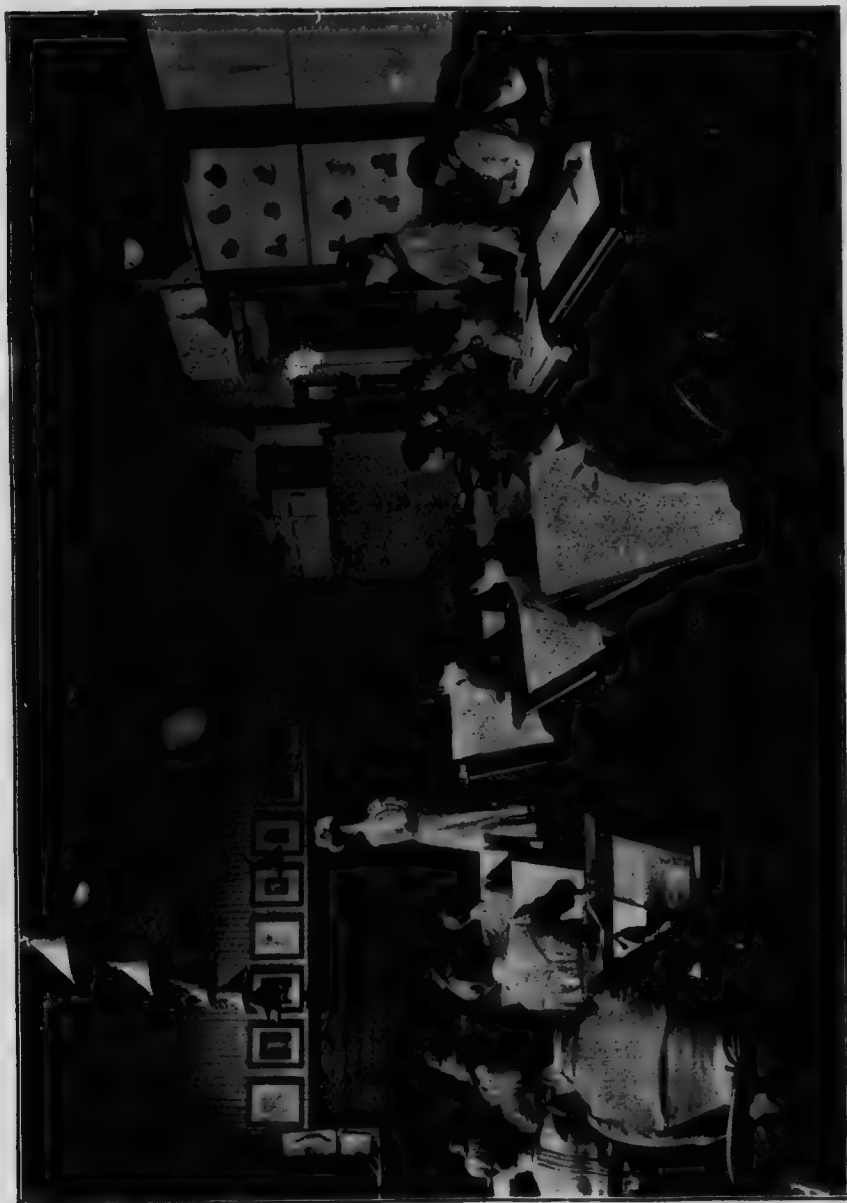


Class at Dressmaking at Pratt Institute, Brooklyn.

7.—THE MANHATTAN TRADE SCHOOL FOR GIRLS, NEW YORK.

This is probably the most interesting and successful effort that has been made in Educational practice in the New World. This was my second visit to the school and proved even more useful than the first. It depends for its support entirely on voluntary contributions. In 1905

it expended nearly \$30,000. Its aim is to fit girls for the actual needs of trade. The departments are based on the use of the needle, the sewing machine, and the paste brush. Three hundred and fifty students are in attendance. A new building has been purchased at a cost of \$120,000. The course generally lasts for one year, and whenever a girl has acquired some degree of skill she is sent for a month into some business house to prove her efficiency.



Class in Costume Designing, Pratt Institute, Brooklyn.

She returns to the school with the comments of her employer, and these assist the faculty in deciding whether or not she is approaching the demands of her trade. The Director of the school is Professor Mary Scheneck Woolman, Director of Domestic Art, Teachers' College, Columbia University, and never before has such a close connection been made and maintained between education and practical life as is to be seen here. Every one of the teachers has been

actually engaged in the trade she is teaching, and conversations with them and inspection of their methods show that they have a thorough grasp of the requirements of their students. Academic work and physical culture are properly attended to. It is the aim of the school to make the training given, an enlightened apprenticeship. Trade work is taken at regular market prices, and in 1905 orders to the amount of \$2,387.76 were filled. The practice work is not sold but



Drawing from the Model, Pratt Institute, Brooklyn.

the seconds (work just below the trade standard) are disposed of to the children or their families at prices slightly above the cost of materials. A remunerative position is found for every girl who successfully accomplishes the work given. The tuition is entirely free, and where wages are an absolute necessity to the family, aid is given to enable a girl to attend the school. In every case the wage earning power of the girls has been materially increased. That the in-

struction given is of the right kind is shown by the fact that the demand for its workers is greater than the supply, and those firms which have tried them even offer a premium for obtaining more. The possibilities of a school of this type seem almost endless, and the work being done here is receiving much attention from every part of the world.



Wood, Turning and Pattern Making Pratt Institute, Brooklyn.

8.—PRATT INSTITUTE, BROOKLYN,

Is a private institution established in 1887. The main building is 100 feet by 86 feet, and six stories high. A trades school building recently erected is 32 feet by 110 feet and four stories high. Under the present plan of organization the work of the institute is divided among the following departments: High School, Fine Arts, Domestic Art, Domestic Science,

Science and Technology, Kindergarten, Libraries and Physical Training. The Domestic Science Department differs from Drexel and other institutions of the same type in being much plainer, and the authorities contend more useful. It is the opinion of the Director of this Department that it is a mistake to equip with luxurious apparatus that is not found in the average kitchen. The department of Science and Technology takes in all the courses especially fitted



Household Science, Pratt Institute.

nen. These are divided into three classes. First, the day school provides technical courses in mechanical and electrical work, which cover a period of two years. Second, evening technical courses in physics, chemistry, applied electricity, mechanical drawing and machine design, steam and the steam engine, and strength of materials. Third, evening trade classes in carpentry, pattern

making machine work, mechanical drawing, plumbing, sign painting and fresco painting. Most of the instructors are graduates of colleges or scientific schools and many of the Technical instructors were educated in the Institute. In the trade work the teachers are men who have gained prominence in their several trades, and are for the most part self-educated or were trained in the Insti-



Machine Shop, Pratt Institute.

tute. Space will not allow of any further description. Suffice it to say that here and at the Drexel Institute, Philadelphia, which was visited on a previous occasion, may be seen almost every department of practical education which has ever found a place in educational systems, and each repays prolonged investigation.

9.—THE NEW YORK TRADE SCHOOL.

This was the second of the three purely trade schools visited. It was founded in 1881 for the purpose of providing young men, who have a bent for mechanics, the opportunity of acquiring the knowledge of some trade that will be to its possessor a means of livelihood. The work given is such as will be met with in actual practice at the trade. The teachers are all mechanics who have gained their knowledge in the shops. The plan of the building is unique and so arranged as to secure large floor space and ample light and ventilation. The plan attached shows the general arrangement. Day and evening classes are provided in the following trades: plumbing, house painting, fresco painting, sign painting, brick-laying, plastering, steam fitting and electrical work, carpentry and cabinet making. Amongst the students in the session just closed were youths from New Brunswick, Prince Edward Island, Nova Scotia, Newfoundland, Ontario and Quebec. The school year extends from October to April. Though 800 students were



New York Trade School.

trained last year only about one-fourth of the applicants could be received. The land, buildings and equipment cost \$300,000, and the school is supported by fees and an endowment fund.

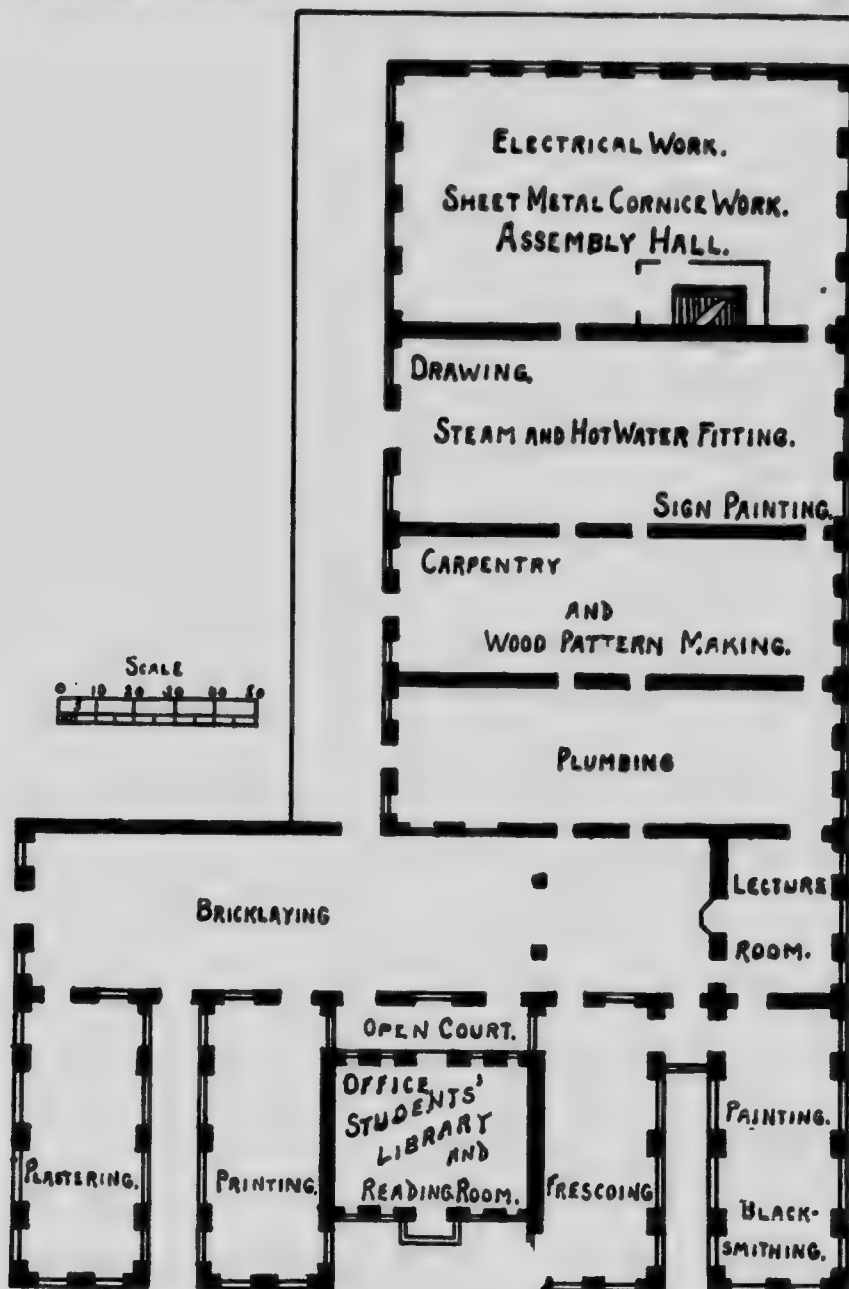
10.—NORTH-EAST MANUAL TRAINING HIGH SCHOOL, PHILADELPHIA.

This school occupies a new building costing about \$467,000 and I had the honour of being presented with the first copy of the prospectus ever sent out. The course given lasts for a period of three years. The auditorium is a feature of the school with its pipe organ, costing \$3,000, raised by private subscription. On the library table I counted sixteen technical magazines relating to the various branches taught in the school, and they bore every evidence of much use. The head of each department receives a salary of \$2,500. The curriculum is based upon the usual High School courses in English literature and language, German, French, Spanish, history, mathematics, science and drawing. To these are added courses in the use of tools for working wood and metal. An average of one period per day is given to drawing, two periods to work in the manual department, and three periods to the academic studies. The tool instruction includes joinery, pattern making, wood turning, wood carving, forging, soldering, ornamental iron work, moulding, casting, vise work, sheet metal work and steam engineering.

11.—THE CENTRAL MANUAL TRAINING HIGH SCHOOL, PHILADELPHIA,

Impressed me as being one of the best organized schools of its class I have ever seen. The purpose of the school as expressed by the Principal is "to bring thought and labour together to make the thinker a worker and the worker a thinker." Provision has been made that the boy shall be train

1. Practical English—The language of clear and forcible expression.
2. Practical Government—The basis of good citizenship.
3. Practical Mathematics—For business, construction, engineering



New York Trade School.

4. Practical Science—The active working knowledge of the facts and forces of nature.
5. Practical Hand Culture.



Plastering Department—Students at Work, New York Trade School.

As in most other schools of this type chipping, filing, and fitting is taken in the first year, but the Principal here does not consider the results achieved com-



Brick-laying Department—Students at Work, New York Trade School.

mensurate with the time spent and intends transferring it to the third year. The connection between art and manual training is very closely kept up. The

drawing comes first, then the object is modelled in clay, then in wood, and sometimes in iron and if time allowed the principal is of opinion that much good



North East Manual Training High School, Philadelphia.

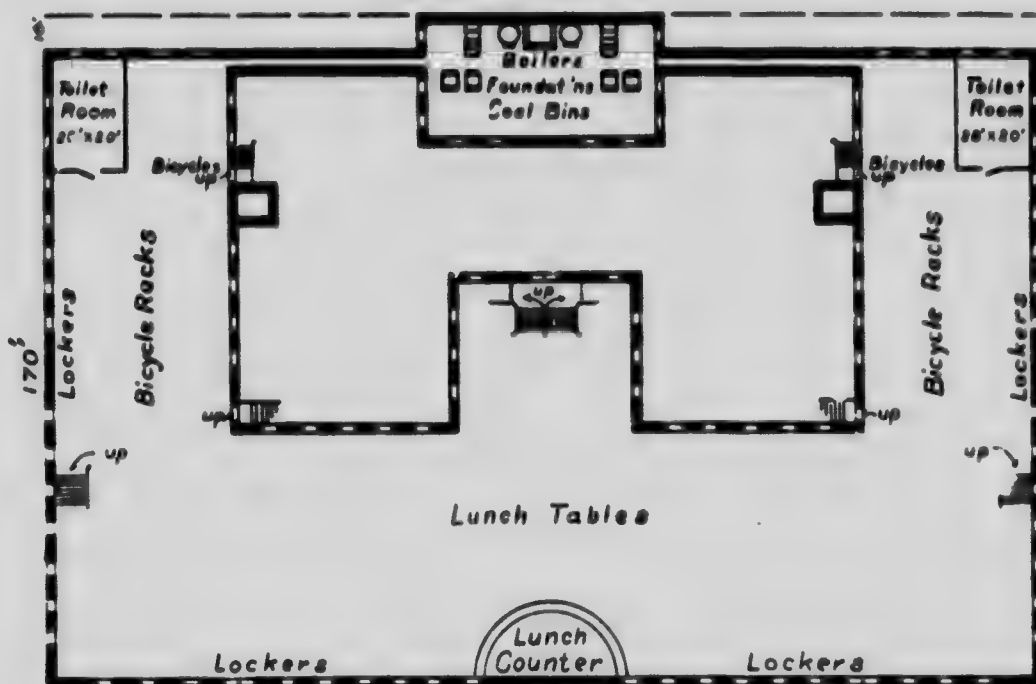
would result by a continuance of the study in stone and marble. The buildings in which the school is held are old and unsuitable. The criticism cannot



Wood-working Department, North East Manual Training High School, Philadelphia.
be brought that money has been spent in bricks and not brains. The excellent work that is being accomplished is owing to the ability, enthusiasm, and organ-

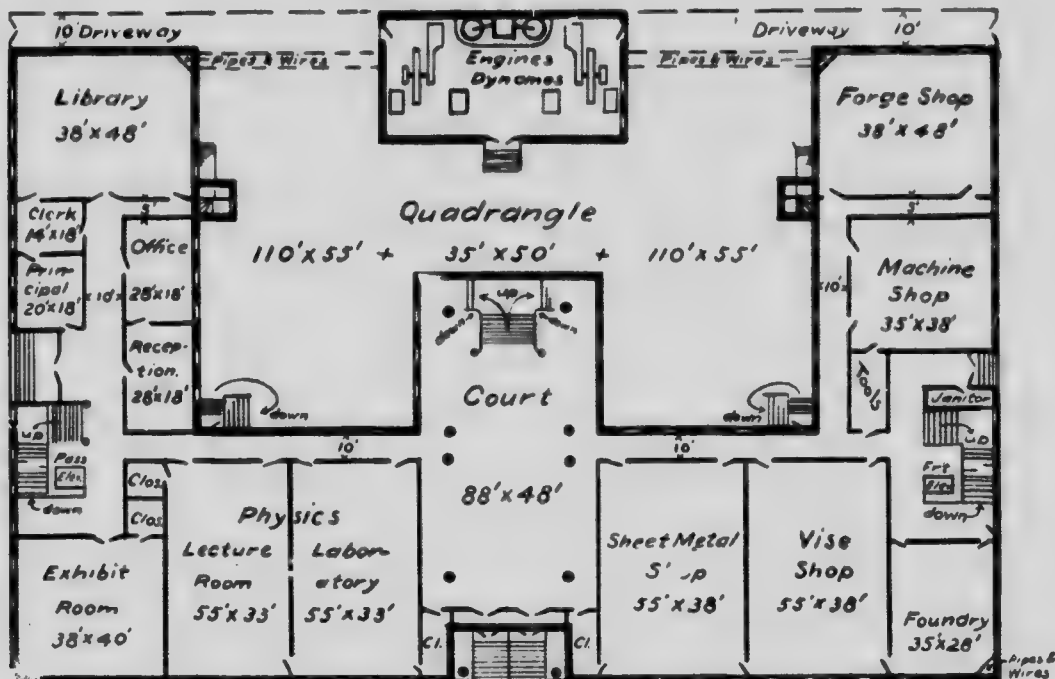
ization of the principal and the staff, and not to any facilities offered by the building. All kinds of ingenious expedients are resorted to, to overcome diffi-

Basement Plan



Floor to be 265' below street level

1st Floor Plan.

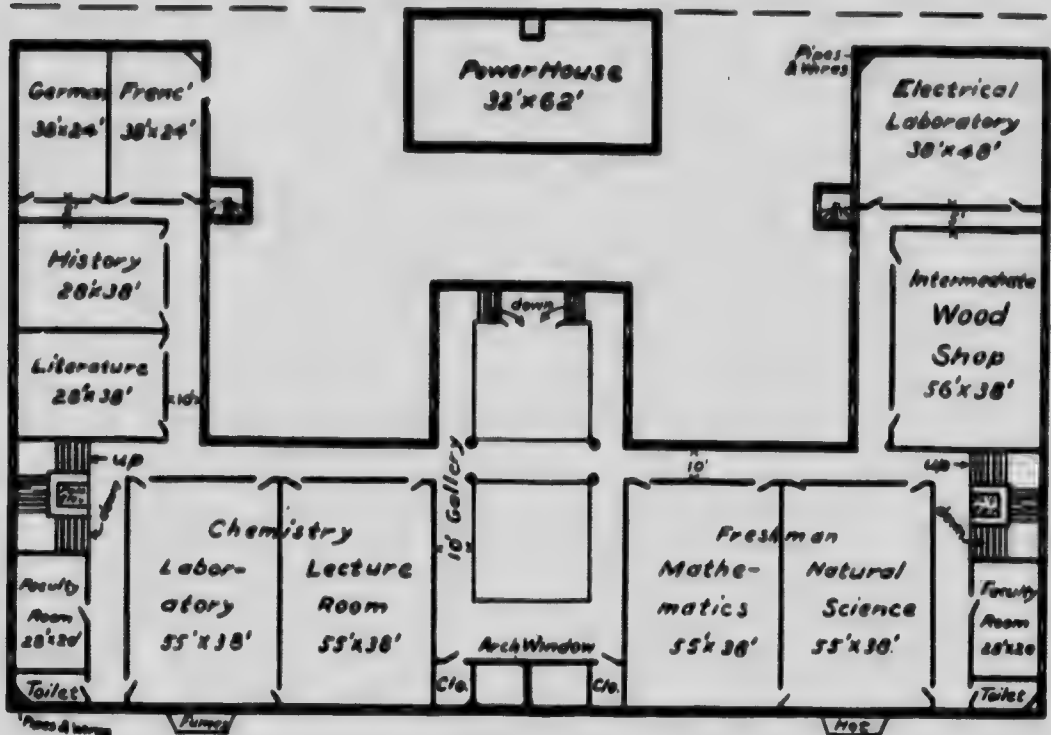


Floor to be 4' above street level

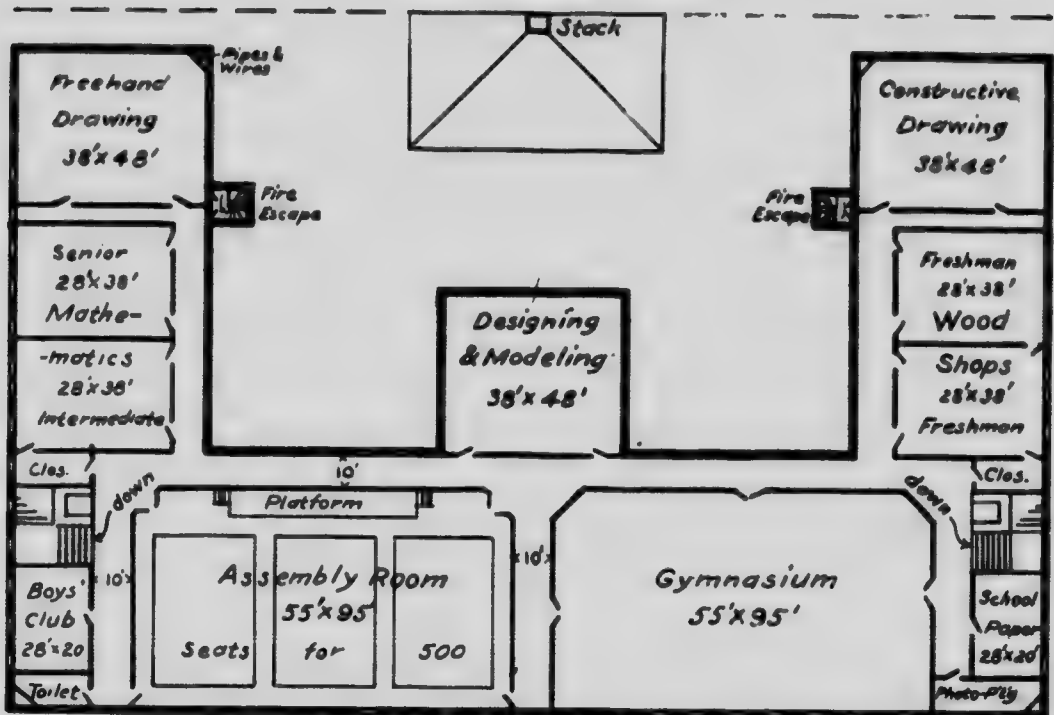
Proposed Manual Training High School, Philadelphia.

culties, e. g., in one of the wood-working shops the benches can be converted into wood-turning lathes in half an hour. A particularly efficient mechanical drawing

2nd Floor Plan



3rd Floor Plan



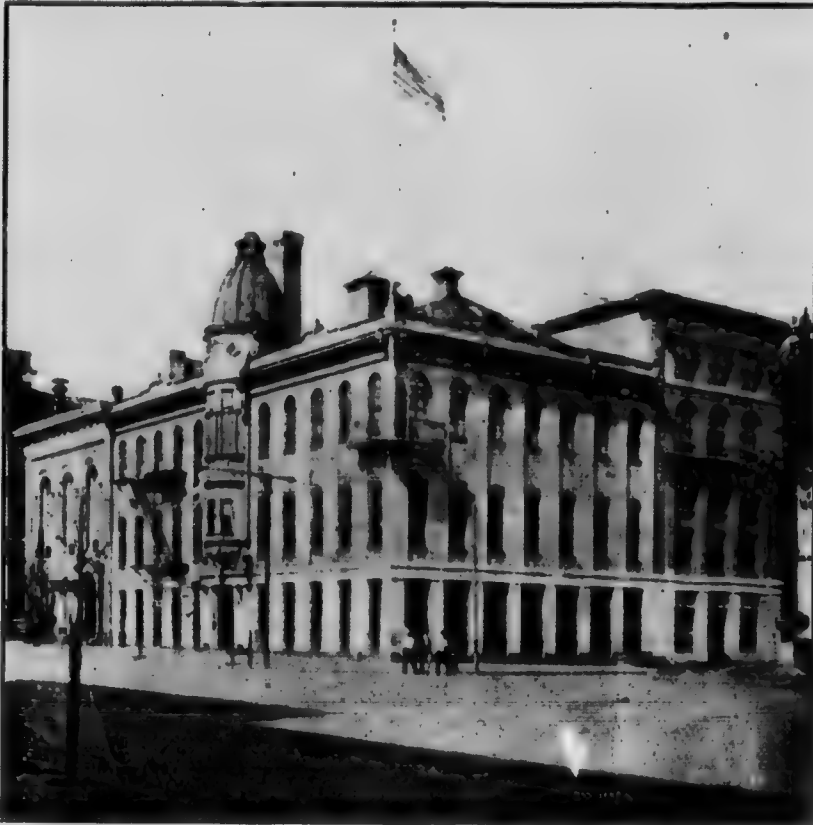
Proposed Manual Training High School, Philadelphia.

table designed by one of the staff, is in use. The ornamental iron work done by the boys is particularly good and is accomplished with very simple appliances. The third year boys take a course in practical surveying. Another distinct feature is the course given in mechanical construction. This is worked out in tin plate and the various mechanical appliances applied to construction in building and engineering are demonstrated by the manufacture of working models. In the wood working departments much stress is laid upon the boy understanding the mechanical principle of every tool used. The teacher here has many original ideas, and unique and effective ways of carrying them out. Plans which are attached have been prepared for a new building.

12.—GIRLS' COMMERCIAL HIGH SCHOOL, PHILADELPHIA.

The North East and Central Manual Training High Schools (10 and 11) are for boys only. The girls are provided for in a separate building under separate management, as far as commercial education is concerned. This school is held in three separate buildings and has an enrollment of 1300 girls from fourteen to eighteen years of age. The course of study is four years in length. Students are admitted from the grammar schools without examination. The Principal and faculty of the school are much pleased at advertisements that have recently appeared in the local papers stating, "Commercial High School graduates preferred."

13.—SPRING GARDEN INSTITUTE, PHILADELPHIA,



Is in art, mechanical and electrical school supported by fees and endowment. Day schools are maintained in the three departments and each department has night classes for apprentices, boys learning trades, and boys and girls still attend-

ing the public schools. The courses are three years in length in both day and evening classes. In the mechanical and electrical departments the students spend eight hours a day in the shops.

14.—JAMES FORTEN ELEMENTARY MANUAL TRAINING SCHOOL,
PHILADELPHIA.

Is situated in one of the slum districts of the city. It was originally a school for coloured children, but owing to the character of the locality changing it is now essentially a Jewish school. I visited it on a Jewish holiday but was shown through the building, had a long conversation with the principal and saw several voluntary classes at work. Each child spends some portion of the day at hand work of various kinds, varying from the kindergarten to advanced woodwork. There are nine hundred children in attendance. Sewing is provided for girls all the way through, with household science for the girls of the upper grades. In the third grade the sewing consists in making a set of doll's clothing on just the same principles as would be followed in making a set for a grown-up person. The cookery room and the woodworking room are also used for classes from neighbouring schools. An experiment is being tried in drawing toys. Each child is provided with a toy as a model and this is drawn and coloured. Some of the results I saw were very creditable. The character of the district is shown by the popularity of a certain model in the wood work course—a shine box, that is a box in which is contained materials for shoe polishing, that being the method by which a large number of the boys earn their living at an early age. The school is particularly fortunate in its principal, Miss Hannah Ashley Fox, a woman of high enthusiasm, excellent judgment, admirable tact, and special training in managing children of unfortunate home influence.

15.—TEXTILE SCHOOL AND SCHOOL OF INDUSTRIAL ART,
PHILADELPHIA.

Textile schools in the United States owe their beginning to the Philadelphia Textile Association. Last year this school was attended by 1018 students, of whom 637 were men and 381 women. Since my last visit to the school a kiln has been added, so that now all modelling done in the school is fired on the premises by the students. The present organization of the school is as follows:

1. *School of Applied Art*: Drawing, applied, design, normal art instruction, wood work and wood carving, decorative painting, illustration, decorative sculpture, architectural drawing and design, metal work, pottery.

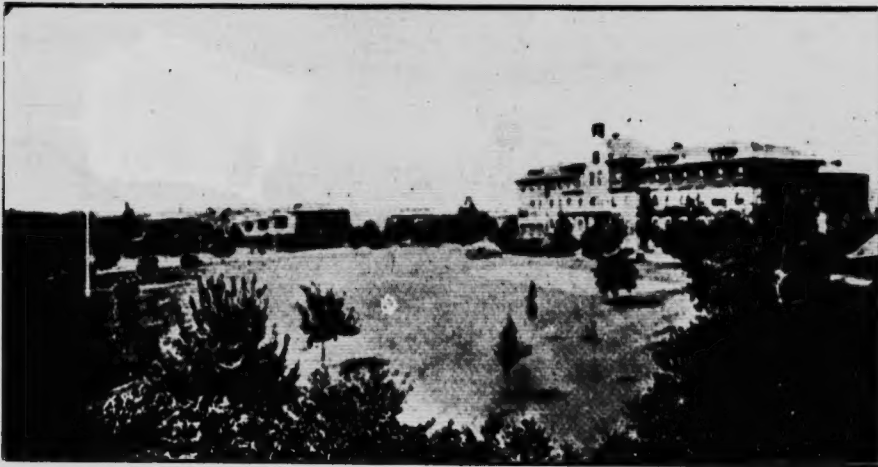
2. *Textile School*: Fabric structure and design, cotton, wool, worsted and silk, warp preparation and weaving, colour harmony and figure design, chemistry, dyeing and printing, wool yarn manufacture, worsted yarn manufacture, cotton yarn manufacture, hosiery knitting, finishing.

3. *School of Modern Languages*.

The quarters in which this school is housed are palatial and the equipment installed to carry out the curriculum above specified, consists of the most modern machinery in every department and no expense has been spared. The school is supported by grants from the State Legislature, by a liberal endowment, and the fees of the students. The museum attached to the school, enriched by many priceless specimens of the arts and industries taught, is invaluable for the purpose of study.

16.—WILLIAMSON FREE SCHOOL OF MECHANICAL TRADES.

This was the last school visited. It is situated about sixteen miles out of Philadelphia. Its aim is to teach certain trades, and the authorities claim that the school can make a better mechanic in three years than could possibly be done in the shops. The problem of trade instruction



Administration Building and Campus.

seems to be to get boys at the proper age and to keep them long enough. This school solves the difficulty by taking them at sixteen or seventeen and feeding and clothing them for a period of three years, the pupils being bound by articles of apprenticeship. As showing the efficiency of



Instruction in Carpentry.

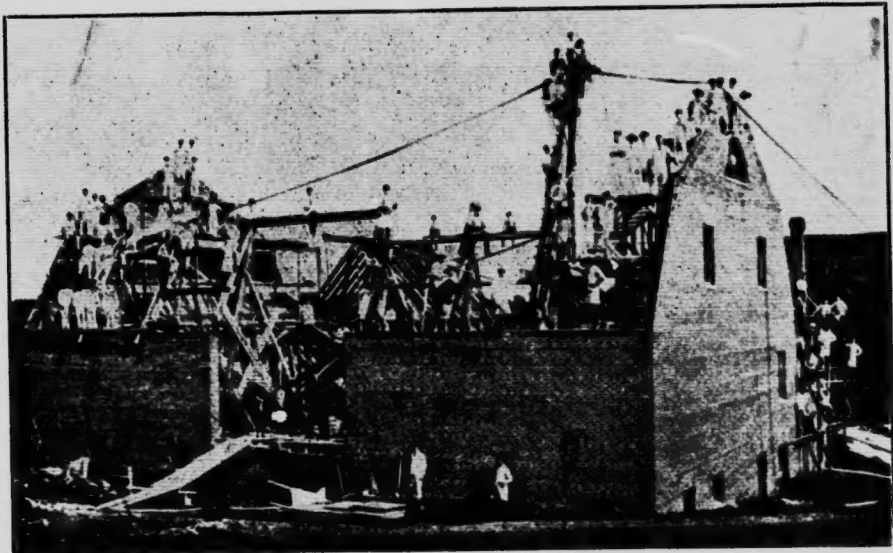
the instruction given, the Pennsylvania Railway Company takes one-third of the product of the school. Seventy-five per cent. of the boys graduated follow mechanical employments. The teachers of the academic work are ladies. Only one applicant in five can be accepted. There are about 300 boys in the school

divided into families of twenty-five, each presided over by a matron. The discipline is excellent. An accidental ringing of the bell in the dining hall brought instant response. The trades taught are as follows: Carpentering, bricklaying, including range, furnace and boiler setting, etc., machine trade in all its usual



Instruction in Machine Work.

details, pattern making, steam and electrical engineering, steam fitting, etc. Each pupil takes but one of the trades named, and his instruction in mechanical and freehand drawing tends in the general direction of his particular trade. The courses are systematic and thorough. Three-quarters of the expense is



School Barn Erected by Students.

incurred in housing the boys. The grounds are 230 acres in extent, occupied by twenty-four buildings. The class unit is twenty-five. The founder is buried under the school. The capital consists of \$2,160,000 in securities. The plant cost \$500,000 and by the trust deed only 80% of the income is allowed to be

spent annually. The machine shop is fitted with various types of machines so that students may gain varied experience. The school has its own water and power plant. The city of Philadelphia has just appropriated a large sum of money for the establishment of a trade school as part of its general educational system, and the tendency in the United States seems to be more and more in the direction of definite trade teaching.

I shall be glad to answer any questions that this necessarily brief report may suggest.

Your obedient servant,

ALBERT H. LEAKE,

Inspector of Technical Education.
